

# PENNSYLVANIA'S STRATEGY FOR ASSESSING SURFACE WATERS – A "CENSUS APPROACH"

*presented by*

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**NATIONAL WATER QUALITY MONITORING COUNCIL**  
***Working Together for Clean Water***



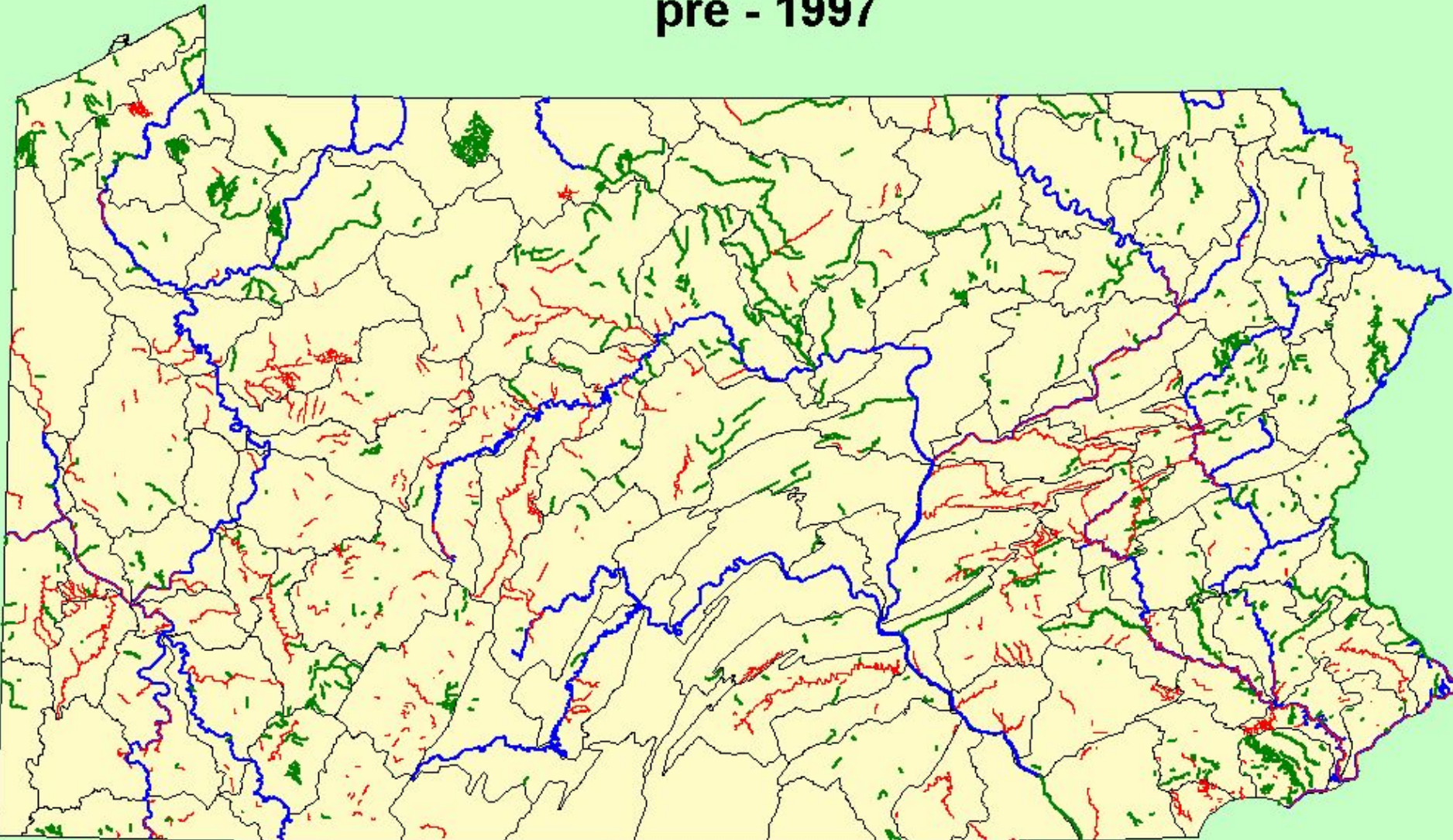
# Pennsylvania Water Quality Monitoring pre - 1997


- **Pennsylvania water quality monitoring programs have focused on point source (PS) impacts and control**
- **Well-established fixed station network for large basin monitoring**
- **Non-point sources (NPS) received very little emphasis**

- **83,000+ Stream Miles**
- **70,400+ stream miles (85%) have never been assessed**
- **Estimated 95 staff years of effort to assess the remaining 70,400+ stream miles**

# PENNSYLVANIA'S ASSESSED WATERS

pre - 1997



 attaining uses  
 impaired uses

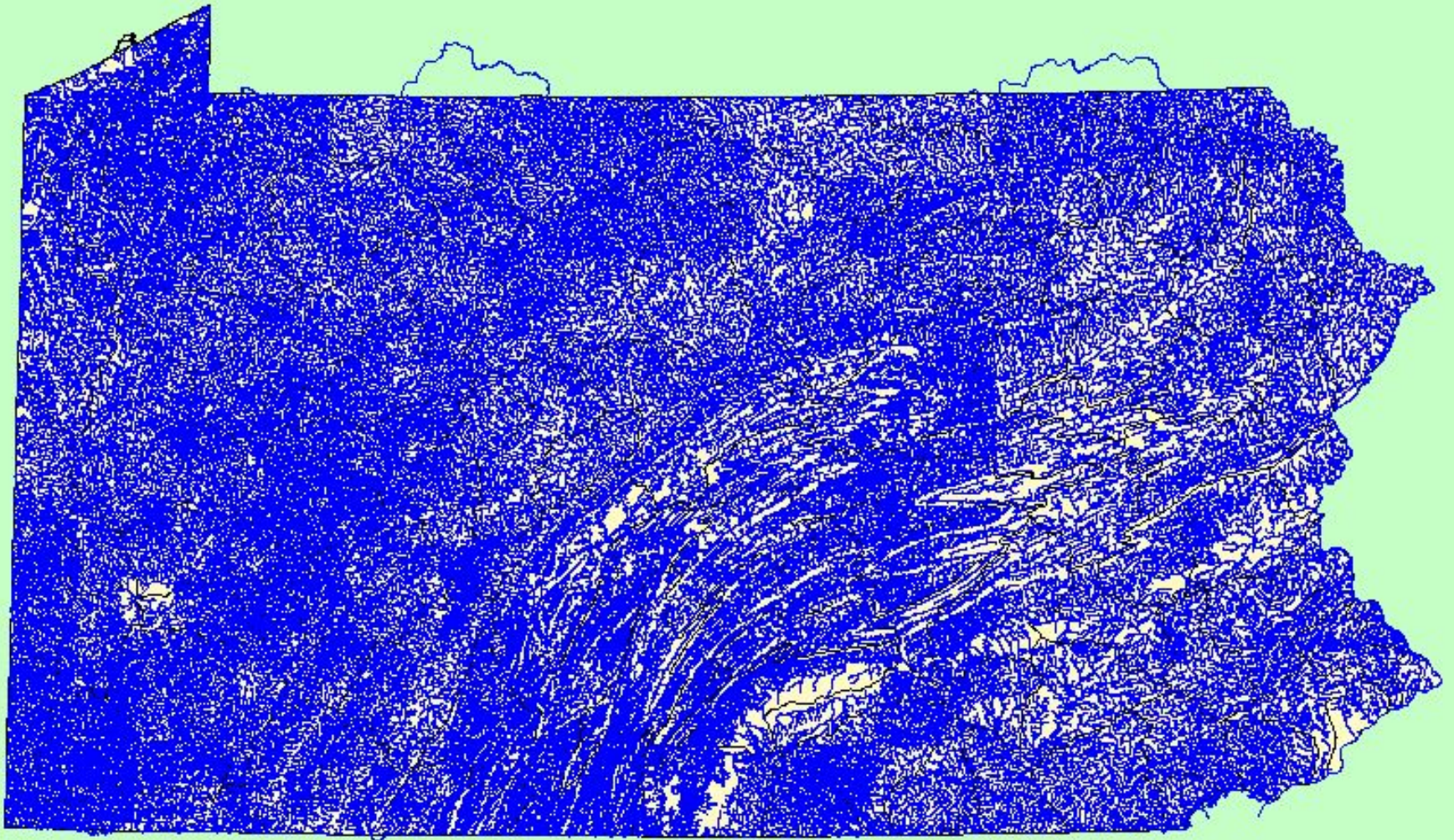
# PENNSYLVANIA'S "WAKE UP" CALL

Legal challenges of EPA's oversight of many State Water Quality Monitoring Programs raised specific concerns in Pennsylvania over the lack of progress in:

- **Completing a 1<sup>st</sup> time state-wide surface water assessment, and**
- **Identification and remediation of non-point source problem areas.**



# PENNSYLVANIA'S STATEWIDE SURFACE WATERS

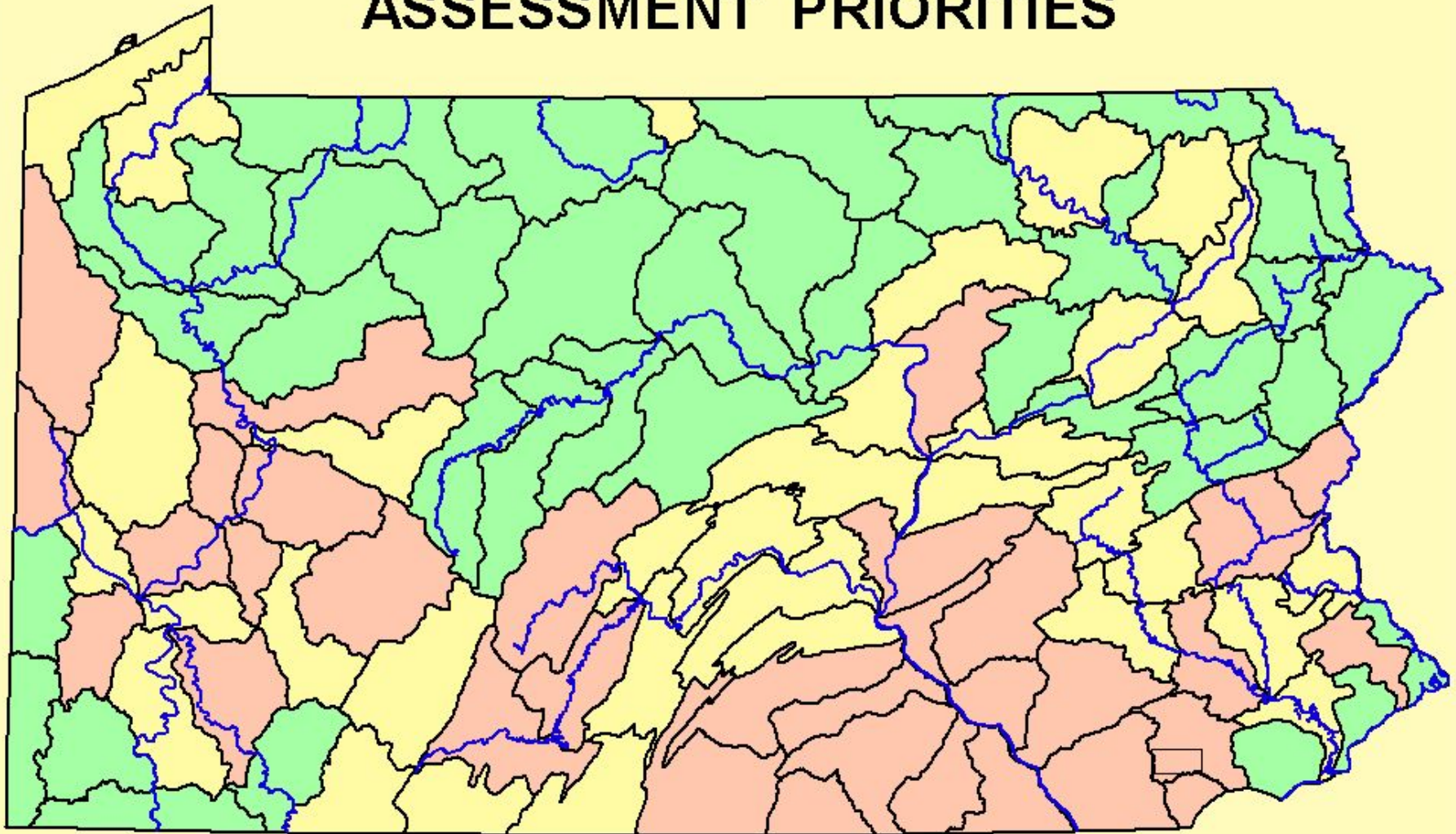


# **PROACTIVELY, PENNSYLVANIA DESIGNED A MONITORING STRATEGY USING A “CENSUS APPROACH” TO ACCOMPLISH THE FOLLOWING OBJECTIVES:**

- **Assess all surface waters within 10 years;**
- **Assess quickly and effectively as possible in a way that would:**
  - **Identify impaired stream segments;**
  - **Document non-point source impairment conditions state-wide;**
  - **Identify proper follow-up remedial or protective action, as necessary.**



# PENNSYLVANIA WATERSHED ASSESSMENT PRIORITIES

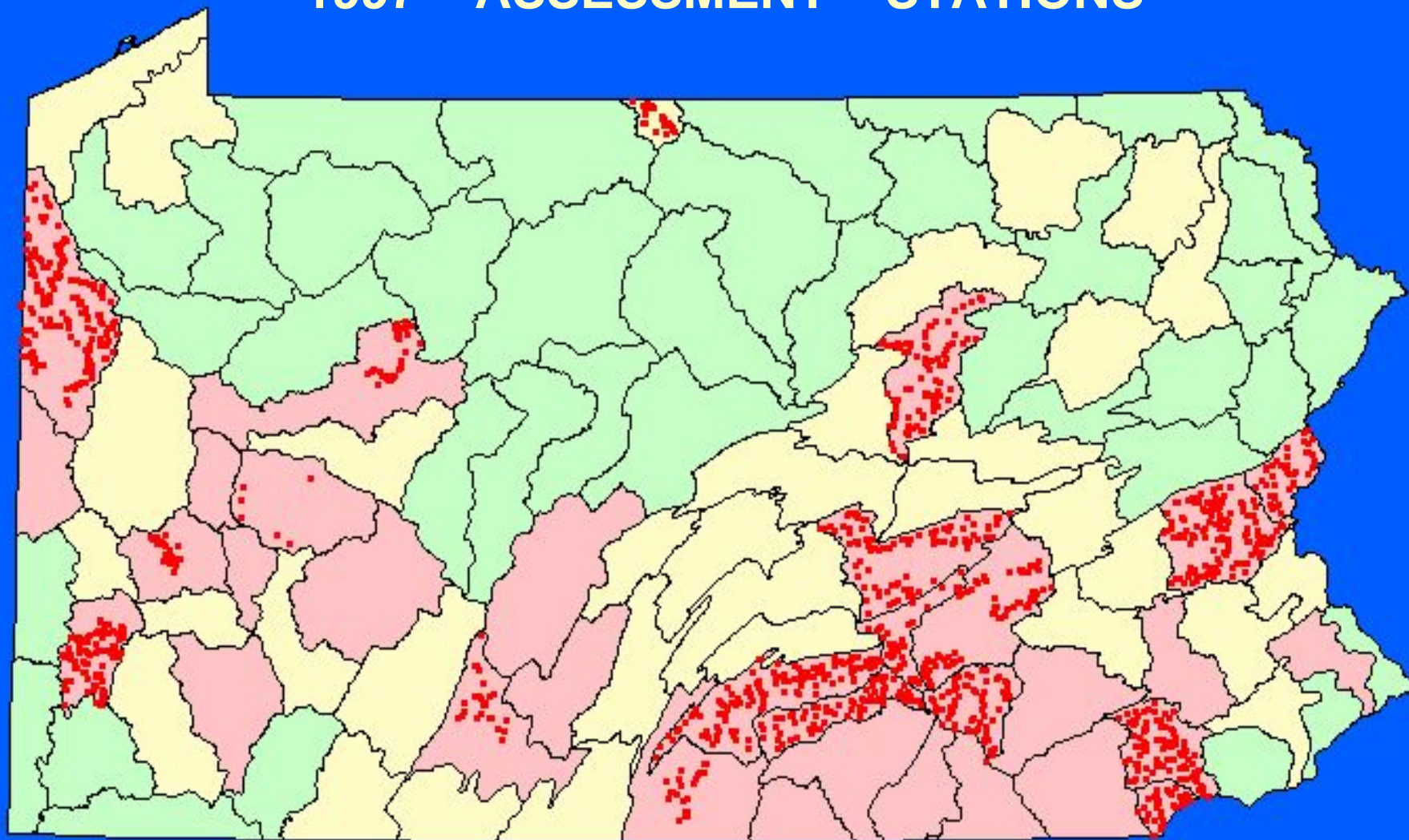


## ASSESSMENT PRIORITIES

- HIGH
- LOW
- MEDIUM

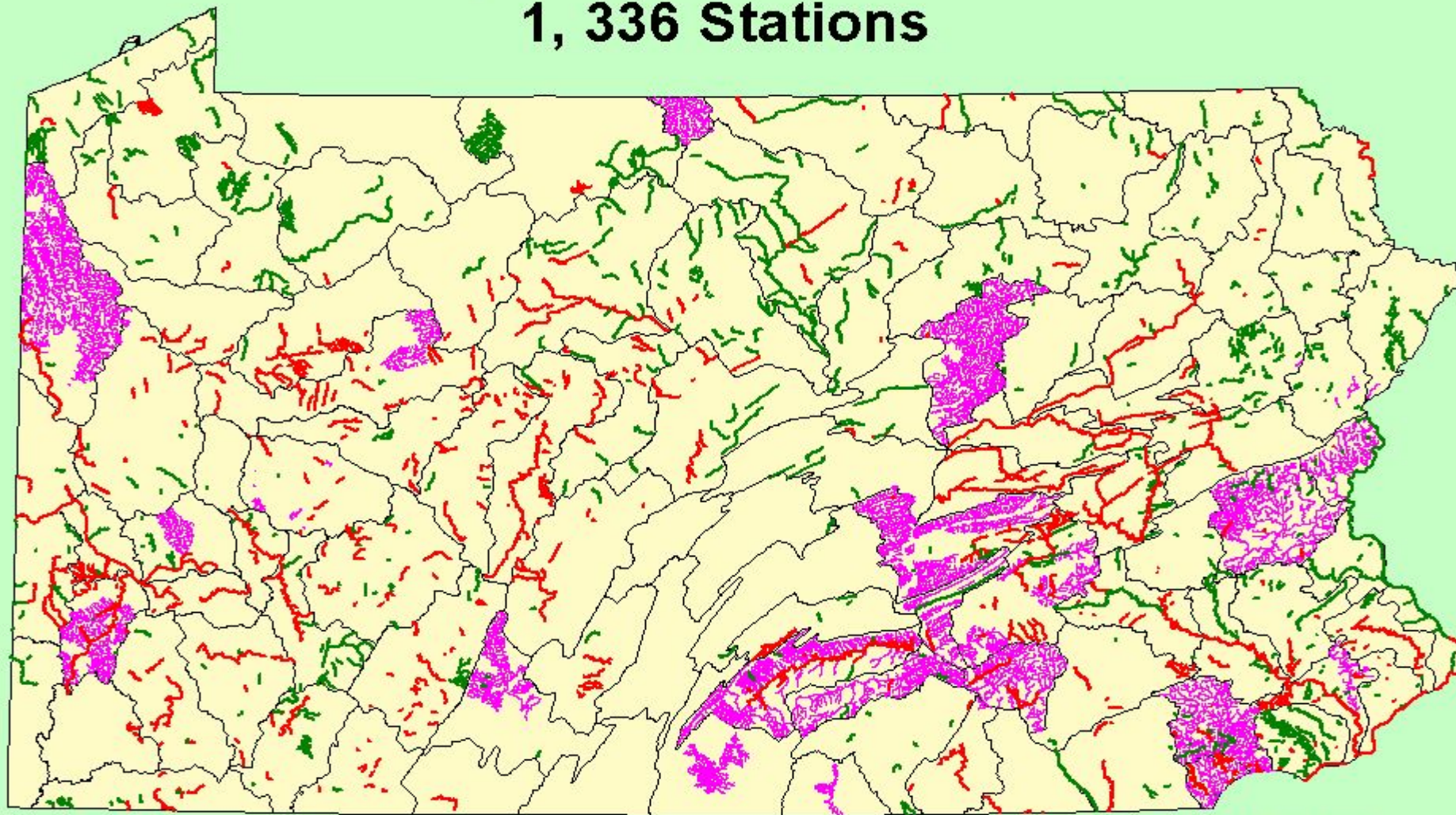


# 1997 ASSESSMENT STATIONS





**1997 - FIRST ASSESSMENT YEAR**  
**12,902 Assessed Miles**  
**1, 336 Stations**



1996 305b Assessments

attaining

impaired

1997 Stream Assessments

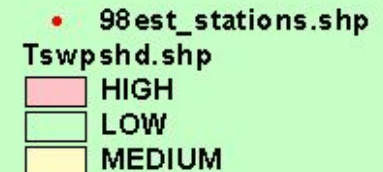
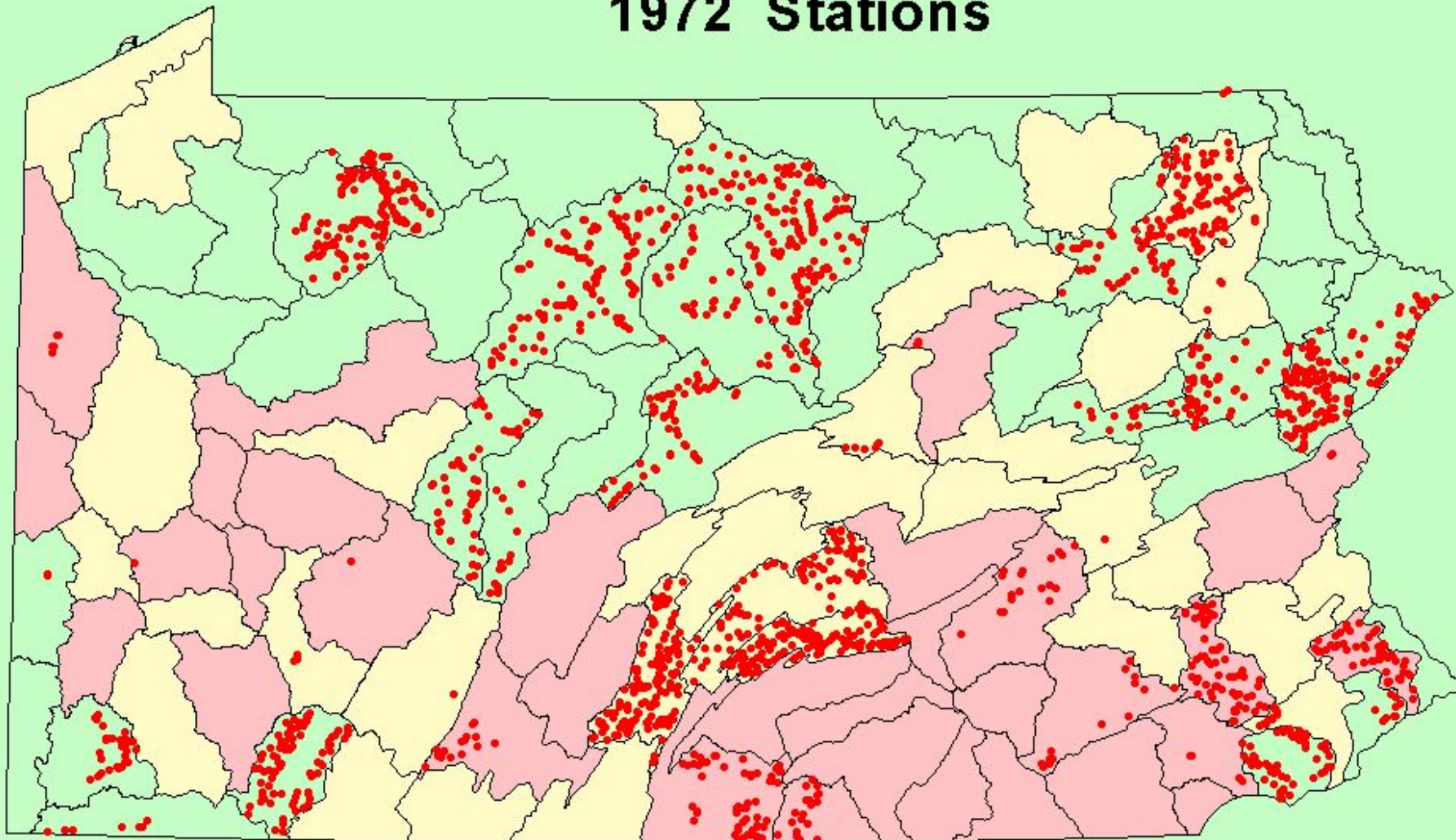
Tswps hd.shp



# 1998 - ASSESSMENT PRIORITY SHIFT

## 11506 Assessed Miles

### 1972 Stations

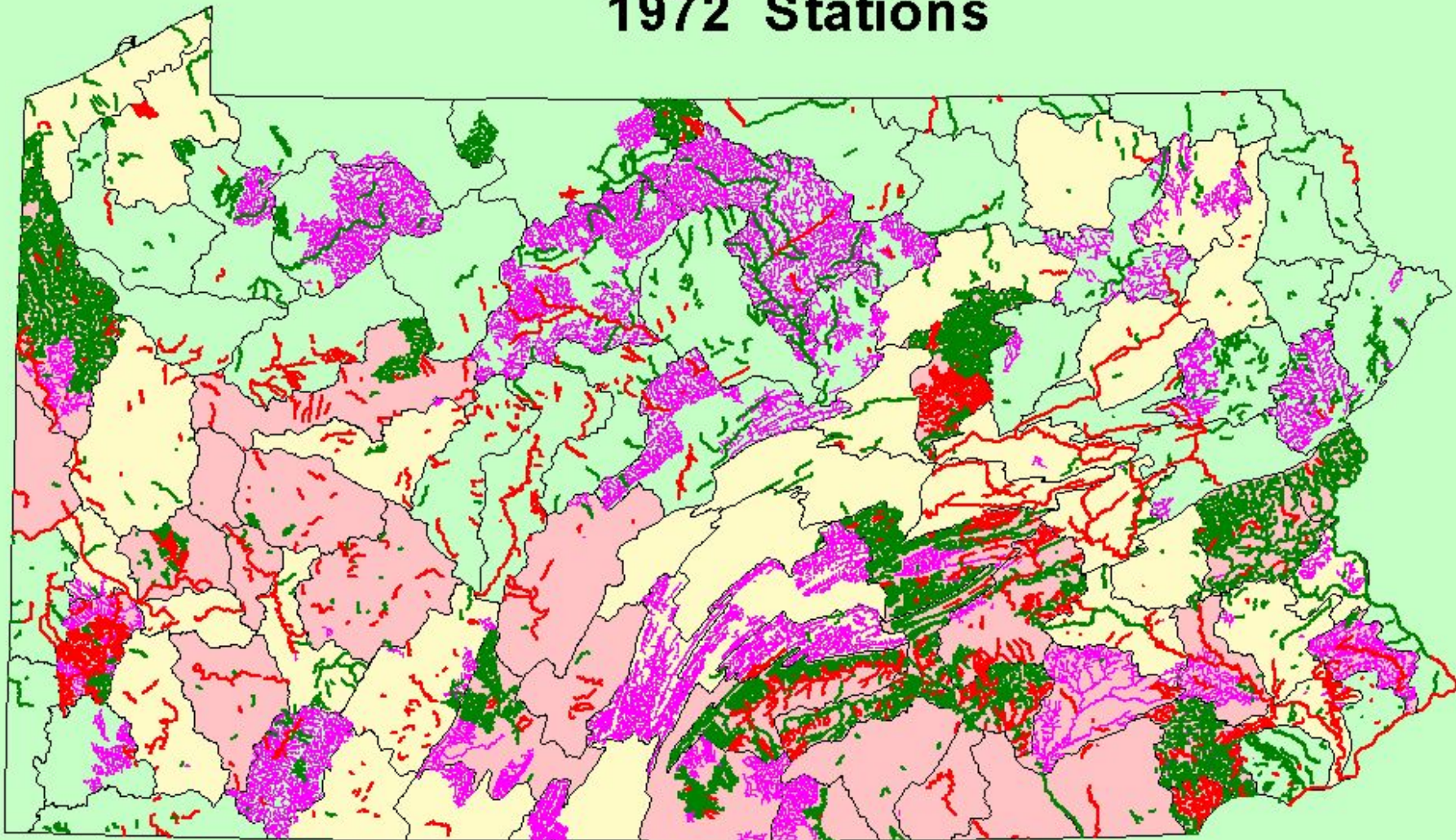




# 1998 - ASSESSMENT PRIORITY SHIFT

## 11506 Assessed Miles

### 1972 Stations



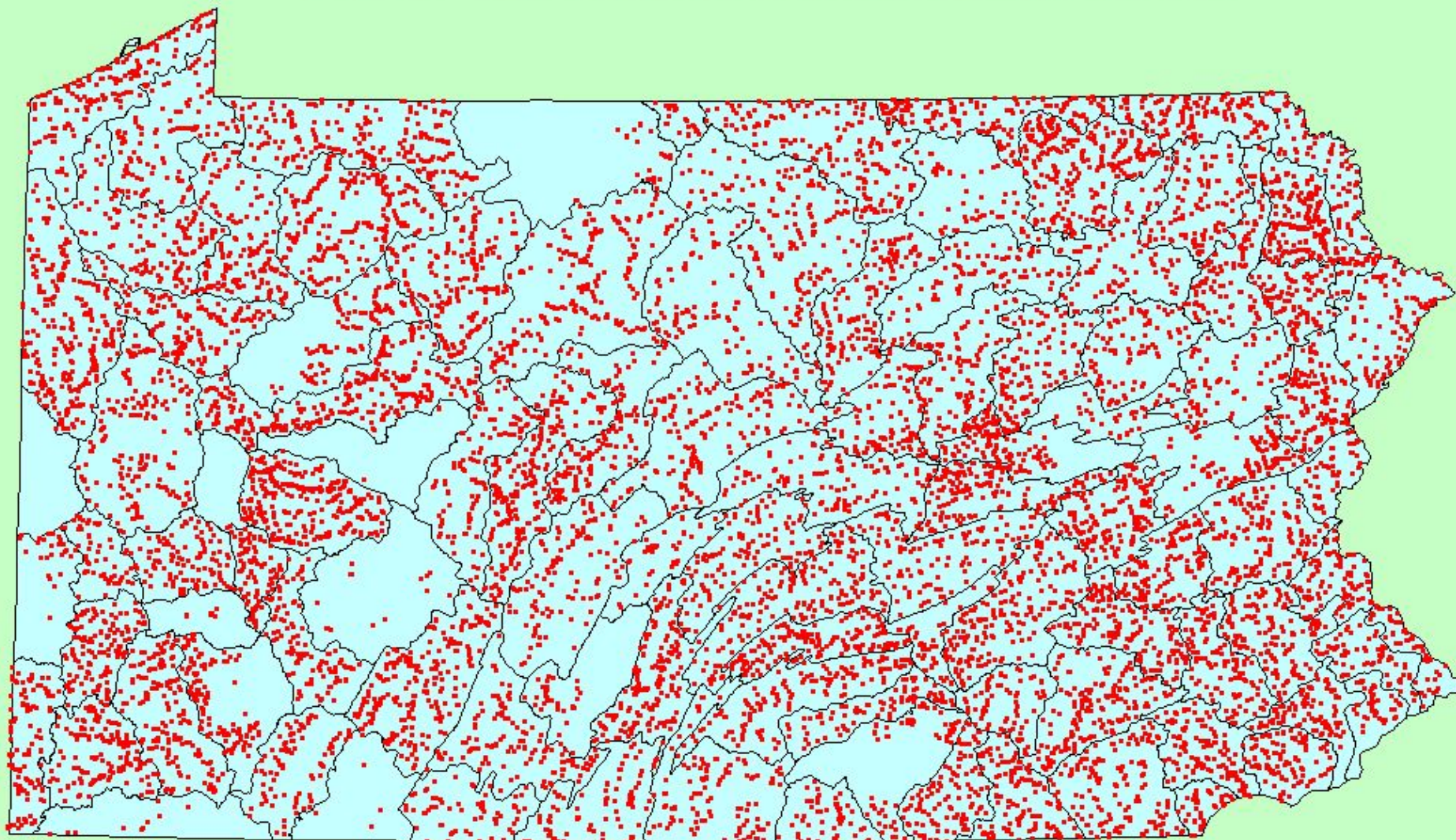
Assessments as of 1997

- Attained
- Impaired
- 1998 Assessments
- Twp.bnd.shp
- HIGH
- LOW
- MEDIUM



# 1997 - 2003

## 12515 STATION ASSESSMENTS

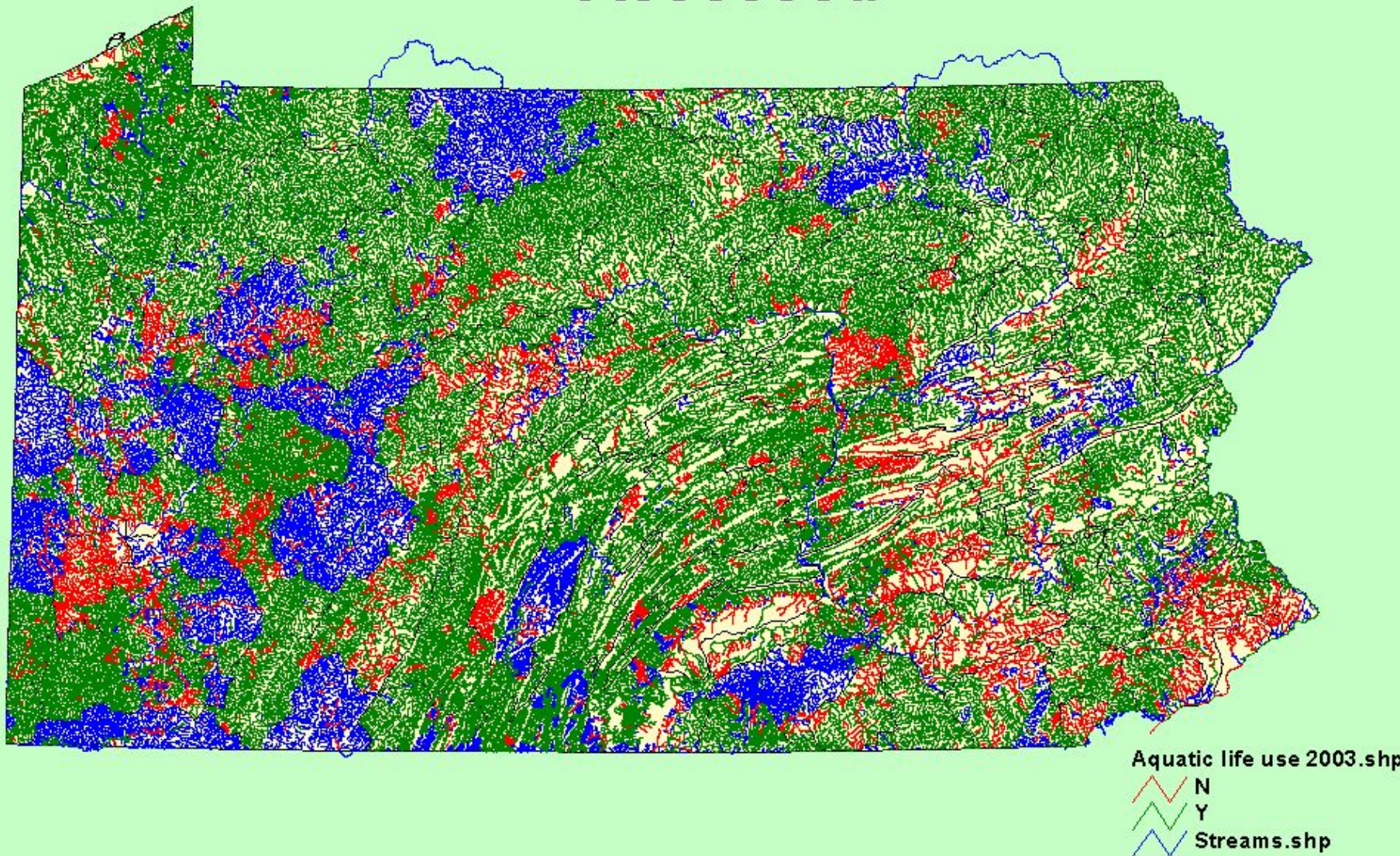


Stations 2004.shp

Tswpshd.shp



# 1997 - 2003 67865 Stream Miles Assessed





**PENNSYLVANIA**  
**SURFACE WATER ASSESSMENT PROGRAM**  
**- 1997-2003 Stream Mileage Summary -**

305(b)	1997	1998	1999	2000	2001	2002	2003	Total
Unassessed	70,259	58,753	47,665	37,927	29,543	19,867	15,296	15,296
Supporting	8,495	10,475	9,265	8,806	7,101	8,135	3,446	55,723
Impaired	4,407	1,031	1,823	932	1,283	1,541	1,125	12,142
Total Miles								83,161
Total Assessed	12,902	11,506	11,088	9,738	8,384	9,676	4,571	67,865
Total % Assessed	16	14	13	12	10	12	5	82%
# of Stations	1,336	1,972	2,306	1,821	1,650	1,735	1,682	12,502
Miles/Station	9.7	5.8	4.8	5.3	5.1	5.6	2.7	5.4

# Impairment Source (total % miles)

305(b) Report	1996	2004
<b>Point Source</b>		
Municipal	4.14	3.03
Industrial	5.27	1.48
Other	2.91	0.87
<b>Total Impairment %</b>	<b>12.32</b>	<b>5.38</b>

<b>Non-Point Source</b>		
Abandoned Mine Drainage	57.26	27.05
Agriculture	14.08	25.96
Urban Runoff/Storm Sewers	1.58	11.73
Road Runoff	-	4.18
Small Residential Runoff	-	4.12
Habitat Modification	-	3.71
<b>Total Impairment %</b>	<b>87.68</b>	<b>94.62</b>

## Cause Impairment (total % miles)

1996			2004		
1	Metals	47	1	Siltation	28
2	Suspended Solids	12	2	Metals	19
3	Nutrients	11	3	Nutrients	12
4	pH	6	4	pH	11
5	Priority Organics	4	5	Organic Enrichment/Low DO	6
			6	Water/Flow Variability	5
7	Organic Enrichment/DO	3			
			10	Suspended Solids	3
			16	Priority Organics	0.25
	Other	17		Other	16



# **ADVANTAGES:**

- **Based on well-established field methods**
- **Impairment Decisions are quick**
- **About 1.5 Hours / Assessment**

- **Can Targets Specific Stream Segments**
- **Consistent Method for Complete Statewide Assessment**
- **Is Not Season-Dependent**
- **Identified Antidegradation Candidate Streams**

# **DISADVANTAGES:**

- **Based on Skilled Field Benthic Identifications**
- **Requires Well-Experienced Field Biologists**
- **Requires Periodic Habitat Assessment Review**
- **Cannot Detect All Sources and Causes**

- **Requires Some Detailed Follow-up Assessments**
- **Inconsistent Application of Source – Cause Lists**
- **Requires Periodic Updates and Redirection**
- **TMDL Data Support Gaps**



# ACCOMPLISHMENTS

- **First Complete Statewide Assessment**
- **Documentation of Non-Point Source Impairment Location & Extent**
- **Source For 305b & 303d Listings**
- **TMDL Waters Identified**
- **Old 303d Listed Waters Confirmed**
- **Extent Of Abandoned Mine Drainage Updated & Confirmed**

# **NEXT TIME**

## **(Cycle 2 Assessments)**

- **Converting to RBP-based Biological Assessments**
- **Chemistry Sampling for Specific Source Cause Confirmations**
- **Targeting Priorities Based on TMDL Needs and “At Risk” Status**
- **Probabilistic Approach to “Attained” Waters**

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